

This listing of claims will replace all prior versions, and listings, of claims in the application:

The Status of the Claims

1. (Currently Amended) A method of forming quantum dots in a semiconductor device, the method comprising:

adsorbing metal clusters on a silicon substrate by controlling density thereof;
growing silicon by heating the substrate on which the metal clusters are adsorbed;
removing the metal clusters;

forming a silicon oxide layer on the substrate by performing thermal oxidation,
wherein the thermal oxidation uses O₂ gas or NO gas at a temperature of about 800 to
1000°C; and

depositing polysilicon on the oxide layer and patterning the polysilicon and the oxide layer.

2. (Original) A method as defined by claim 1, wherein a metal of the metal clusters is selected from the group consisting of gold, silver, and a transition metal.

3. (Original) A method as defined by claim 1, wherein the silicon is grown by chemical vapor deposition (CVD) method using the metal clusters as a mask.

4. (Original) A method as defined by claim 1, wherein the silicon condenses and grows only between the metal clusters and the silicon substrate and nano-line of the silicon is formed vertically on the surface.

5. (Original) A method as defined by claim 1, wherein the size of the metal clusters is between about 5 and 50 nanometers.

6. (Cancelled)

7. (Cancelled)

8. (New) A method as defined by claim 1, wherein the size of the metal clusters is between about 6 and 50 nanometers.

9. (New) A method of forming quantum dots in a semiconductor device, the method comprising:

adsorbing metal clusters on a silicon substrate by controlling density thereof;

growing silicon by chemical vapor deposition (CVD) using the metal clusters as a mask and heating the substrate on which the metal clusters are adsorbed;

removing the metal clusters;

forming a silicon oxide layer on the substrate; and

depositing polysilicon on the oxide layer and patterning the polysilicon and the oxide layer.

10. (New) A method as defined by claim 1, wherein a metal of the metal clusters is selected from the group consisting of gold, silver, and a transition metal.

11. (New) A method as defined by claim 1, wherein the silicon condenses and grows only between the metal clusters and the silicon substrate and nano-line of the silicon is formed vertically on the surface.

12. (New) A method as defined by claim 1, wherein the size of the metal clusters is between about 5 and 50 nanometers.

13. (New) A method as defined by claim 1, wherein the silicon oxide layer is formed by thermal oxidation method.

14. (New) A method as defined by claim 6, wherein the thermal oxidation method uses O₂ gas or NO gas at a temperature of about 800 to 1000 °C.

15. (New) A method as defined by claim 1, wherein the size of the metal clusters is between about 6 and 50 nanometers.